

Arm Debugging and Profiling Tools Training

- Teach how to use Arm Forge
 - DDT: parallel debugging
 - MAP: profiling
 - Performance Reports: performance characterization

We don't cover GPU this time - no GPU licenses







Arm Debugging and Profiling Tools Training

Tutorial team:

- NERSC: Woo-Sun Yang and Laurie Stephie
- Arm: Ryan Hulguin (lecturer), Beau Paisley, Srinath Vadlamani, Timothy Duthie

Time	Topic	Presenters
9 am	Welcome and Introduction	Woo-Sun
9:10	Intro to Arm tools; remote client setup	Ryan
9:20	Arm DDT	Ryan
9:55	Memory debugging & hands-on	Ryan
10:15	Break	
10:30	Arm Performance Reports & hands-on	Ryan
10:50	Arm MAP & hands-on	Ryan
11:30	Using Forge for Python codes	Ryan and Laurie
12 noon	Break	
12:30-2:00 pm	Work on your own codes	Ryan, Beau, Srinath, Timothy, Laurie, Woo-Sun

Afternoon Session

- Working on user codes with Arm engineers/NERSC staff
 - Five users have signed up
 - Zoom breakout room for a code team
 - https://docs.google.com/spreadsheets/d/1Irwk1oUt7YHnG7 qDz5MX1nOk4H2ZO_dMH3WgV4sO1CU/edit?usp=sharin







If You Are Far Away from NERSC

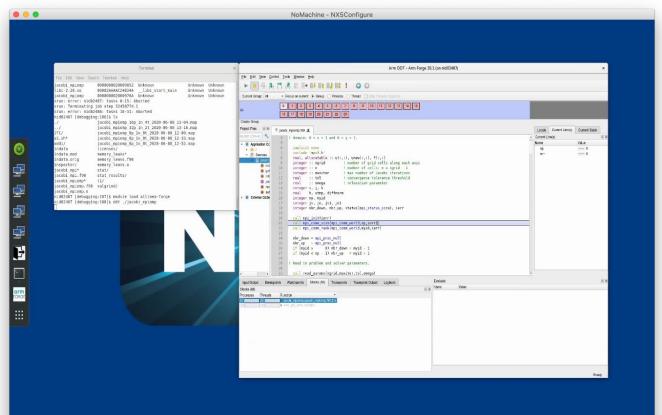
- Remote X window GUI over network: painfully slow responses due to high latency in X window connections
- Two solutions:
 - NoMachine (formerly NX)
 - Improves X window performance
 - How to install and use: https://docs.nersc.gov/connection/nx
 - Arm Forge remote client
 - Download: https://developer.arm.com/tools-and-software/server-and-hpc/downloads/arm-forge
 - Configure:
 https://docs.nersc.gov/development/performance-debugging-tools/ddt/#reverse-connect-using-remote-client
 - Start the client on your laptop/desktop, start a batch job on Cori, and connect them -see Ryan's talks/demos







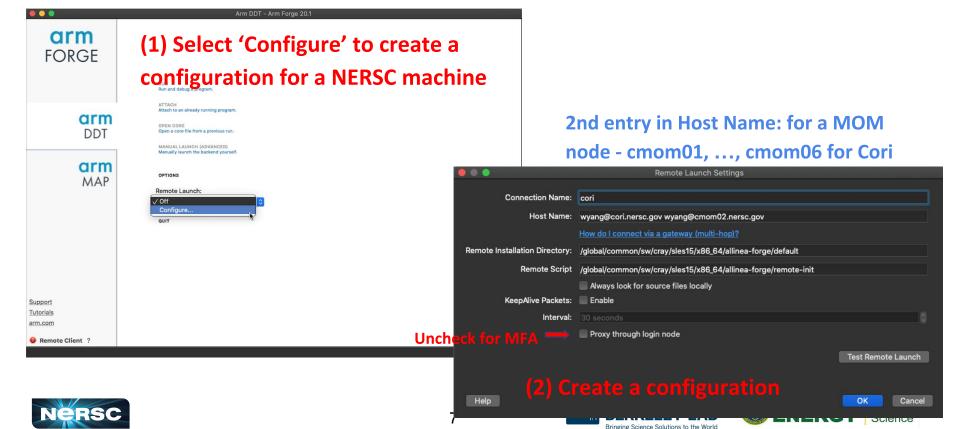
Using NoMachine (NX)





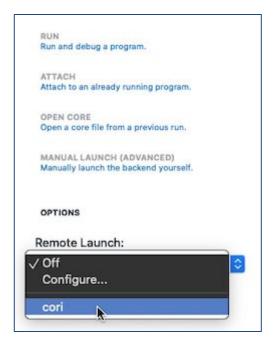


Using Arm Forge Remote Client

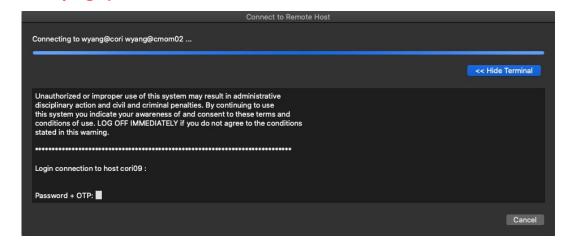


Using Arm Forge Remote Client (Cont'd)

(3) Select the configuration



(4) Log into cori (example below: authenticate using password+OTP); if you set SSH to use sshproxy keys instead, you are NOT prompted to type pw+OTP (see the MFA webpage)







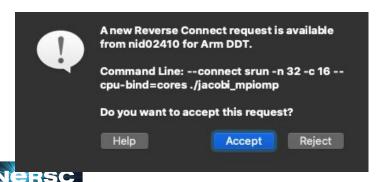


Using Arm Forge Remote Client (Cont'd)

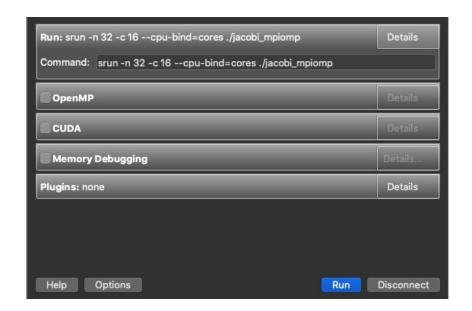
(5) Submit a batch job on a NERSC machine and start DDT

```
$ salloc -N 2 -C knl -t 30:00 -q debug
...
$ module load allinea-forge
$ ddt --connect srun ... ./jacobi_mpiomp
```

(6) Accept the connection request



(7) Set parameter and run







Training materials

- In /global/cfs/cdirs/training/2020/arm-tools on Cori
- Hands-on materials in the handson directory
- Python code for demo in the gpu specter directory
 - README.md for info on how to
 - Clone a code repository to your current directory
 - Copy data files
 - Create a conda environment
 - Run with or without Arm Forge
- \$cp -r /global/cfs/cdirs/training/2020/arm-tools .







Job Submission Using Reservation

- Node reservation
 - 100 KNL nodes; 9 am-2 pm
 - Name of the reservation: armtools
 - Project account to charge to: nintern
 - Use debug or interactive qos

```
$ salloc -N 1 -C knl -t 30:00 -q interactive \
  -A nintern --reservation=armtools
```

 If all the reserved nodes are taken, use your own project account







